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Fire resistant glazing strip

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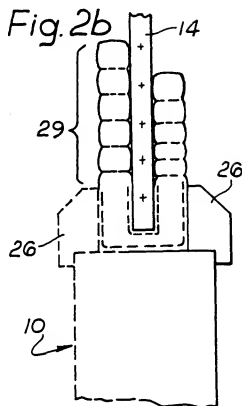
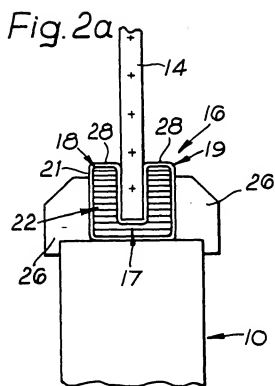
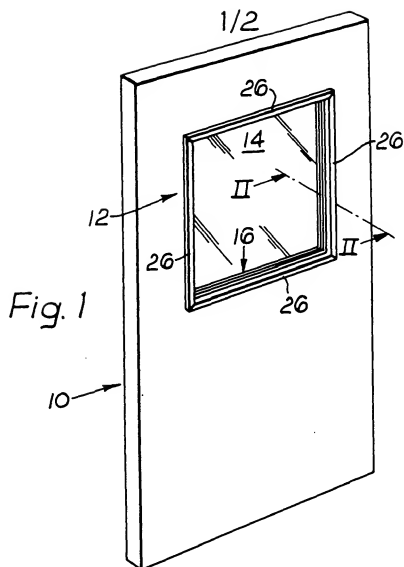
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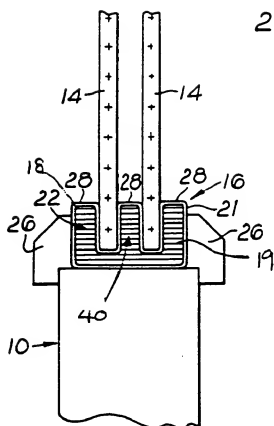


Fig. 3a

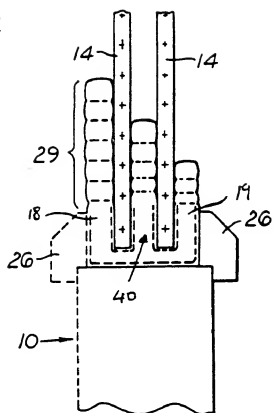


Fig. 3b

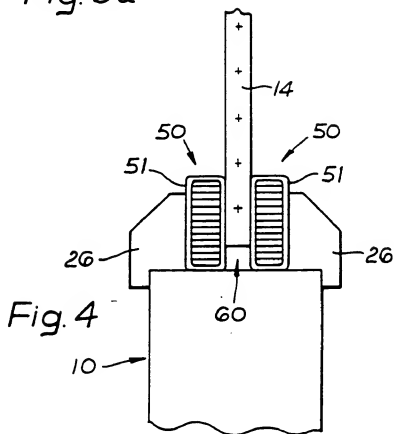


Fig. 4

FIRE RESISTANT GLAZING STRIP

The present invention relates to a fire resistant glazing strip.

When glazing an aperture it is desirable to retain the pane of glass using a glazing strip which holds the
5 pane of glass in position as long as possible in the event of a fire.

This is achieved in accordance with the present invention by insulating a border of the pane from radiant and conducted heat.

10 According to one aspect of the present invention there is provided an intumescent glazing strip including an elongate casing defining a hollow interior which is filled with a hard intumescent material, the casing in cross-section being rectangular in shape, the intumescent
15 material being of laminar form with the layers extending parallel to the shorter sides of the rectangular shape, the layers of intumescent material being formed so that on intumescence expansion occurs predominantly in a direction perpendicular to the plane of the layer, at
20 least one of said shorter sides being formed so as to permit the intumescent material to exude therefrom during intumescence.

According to another aspect of the present invention there is provided an intumescent glazing strip including
25 an elongate casing which in cross-section includes a bottom portion and two opposed side portions which together define a channel for receiving an edge of a pane of glass, at least the side portions being hollow and filled with a hard intumescent material, the intumescent
30 material being of laminar form with the layers extending transversely relative to the channel, each layer of intumescent material being formed so that on intumescence expansion occurs predominantly in a direction perpendicular to the plane of the layer, the terminal end

portion of each side portion being formed so as to permit intumescent material to exude from the interior of the side portion so that during intumescence the intumescent material expands to cover the surface of the pane of glass to define an insulative border of intumesced material.

Reference is now made to the accompanying drawings, in which:-

Figure 1 is a schematic perspective view of an opening in a door glazed in accordance with the present invention;

Figures 2a, 2b are each a section along line II-II in Figure 1 shown prior to and subsequent to intumescence;

Figures 3a, 3b are each a view similar to Figures 2a, 2b of a different embodiment according to the present invention; and

Figure 4 is a similar view to Figure 2a of a further embodiment according to the present invention.

Referring initially to Figure 1 there is shown a door 10 having an opening 12 which is glazed using a single pane of glass 14. The pane of glass 14 is held in position by lengths of an elongate glazing strip 16. The pane holder 16 in cross-section is channel-shaped as clearly seen in Figure 2a, being composed of a bottom portion 17 and two side portions 18, 19 which are spaced apart to define a recess for receiving the pane of glass. The distance between the side portions 18, 19 is chosen so as to be about the same dimension as the thickness of the glass pane which is to be received in the recess so that the glass pane is a tight fit thereby obviating the need for additional sealants such as a mastic compound.

As seen in Figure 2a the glazing strip comprises an outer casing 21 which is preferably formed by extruding a suitable plastics material such as polyvinyl chloride.

The casing 21 defines an inner space which is completely filled with a 'hard' intumescent material 22, preferably a hydrated sodium silicate based intumescent material, such as Palusol (Registered Trade Mark). A 'hard' intumescent material produces a hard or rigid self supporting intumesced material as distinct from 'soft' intumescent materials which provide intumesced materials which are relatively soft or friable. The intumescent material is in a laminate form with the layers lying parallel with the bottom portion i.e. running substantially transversely relative to the defined recess for retaining the glass pane. Each layer is formed from a strip of intumescent material which is adapted so as to expand, on intumescence, in one predominant direction which direction is in the thickness dimension of the strip or the layer defined thereby. In order to create such an expansion in one direction the strip may be reinforced with for instance glass fibres and possible wire mesh; the reinforcement serving to restrict expansion in the widthwise direction of the strip but allowing unimpeded expansion in the thickness direction.

The pane of glass 14 illustrated in Figure 1 is provided with a length of the glazing strip 16 extending along each side, the lengths either being butt jointed or mitred at the corners of the pane. Preferably the lengths of glazing strips 16 are sealed at their ends to prevent ingress of moisture to the intumescent material.

The lengths of the glazing strips 16 are held in position within the opening by being sandwiched between lengths of hardwood beadings 26. Preferably the beadings 26 are of a smaller height than the glazing strip so that in the event of fire on one side of the pane of glass, the beading on the opposite side of the pane of glass is shielded from radiant heat by the glazing strip 16.

In the event of fire occurring on one side of the

pane of glass, the intumescent material within the lengths of the glazing strip intumesces. The laminar arrangement of the intumescent material results in expansion occurring predominantly in a direction directly
5 away from the bottom portion 17 and so the intumescent material bursts through the end walls 28 of the side portions. The arrangement is designed such that when the intumescent material exudes from the side portion it lies close to or contacts the surface of the pane of glass.
10 Accordingly as the intumescent material expands in the predominant direction of expansion it flows across the surface of the pane of glass (whilst in close proximity or actually contacting said surface) to define an insulative border 29 of intumescent material which
15 surrounds the periphery of the pane of glass. The border 29 is supported in position primarily by its inherent strength. The border portion 29 of intumescent material shields the glass covered thereby from radiant heat and insulates it against conducted heat and so delays the
20 softening of the covered area of glass.

Accordingly the covered area of glass extending about the periphery of the frame tends to remain rigid and so remains in position as long as the glazing strip remains intact. In addition the border 29 of intumescent
25 material also reduces the area of exposed glass through which radiant heat may be transmitted to the opposite side of the door.

Since the amount of expansion of each individual layer of intumescent material can be predicted, the
30 number of layers of intumescent material contained in each side portion 18, 19 can be chosen to suit individual applications and the height of the side portions 18, 19 may be varied accordingly. In this respect, the number of layers of intumescent material are preferably chosen
35 so that after intumescence, the area of glass covered by

the intumescent material covers at least 20 per cent of the normal exposed surface of the pane of glass.

The upper glazing strip 16 is restrained from falling by its jointed connection at either end to the neighbouring glazing strip 16. In addition, as intumescence progresses, the intumesced material exuding from the side strips interferes with the intumescent material exuding from the upper strip to add support thereto.

A modification is illustrated in Figures 3a, 3b wherein the glazing strip 16 is adapted to hold two panes of glass 14 instead of one. The principles of construction and function for the modified glazing strip are the same as for the glazing strip illustrated in Figures 2a, 2b. Accordingly similar parts are designated with the same reference numerals.

In the embodiment shown in Figures 3a, 3b the intermediate portion 40 located between side portions 18, 19 is shown as being hollow and filled with laminae of hard intumescent material.

It is envisaged that since the intumesced material exuding from the intermediate portion 40 is supported between the two panes of glass the intermediate portion 40 may incorporate a soft intumescent material preferably having a high expansion factor on intumescence. A main advantage of using such a soft intumescent material in portion 40 is that a very high proportion, if not all of the area of glass may be covered to thereby restrict radiation of heat through to the opposite side.

A further embodiment is illustrated in Figure 4 wherein the side portions 18, 19 are illustrated as being formed from individual glazing strips 50. Each strip 50 is formed by a casing 51 of rectangular cross-section which defines a hollow interior filled with the laminar arrangement of hard intumescent strips as described

above. The layers of the laminar arrangement are arranged to extend parallel to the shorter sides of the casing 51. The casing 51 is preferably an extrusion formed from a plastics material such as polyvinyl-chloride. The strips 50 function in use in the same manner as the side portions 18, 19 described above. The area 60 may be filled with any convenient material, for instance mastic, a glazing bead, an intumescent strip or by a shoulder integrally formed on each casing 51.

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CLAIMS

1. An intumescent glazing strip including an elongate casing defining a hollow interior which is filled with a hard intumescent material, the casing in cross-section being rectangular in shape, the intumescent material
5 being of laminar form with the layers extending parallel to the shorter sides of the rectangular shape the layers of intumescent material being formed so that on intumescence expansion occurs predominantly in a direction perpendicular to the plane of the layer, at
10 least one of said shorter sides being formed so as to permit the intumescent material to exude therefrom during intumescence.

2. An intumescent glazing strip including an elongate casing which in cross-section includes a bottom portion
15 and two opposed side portions which together define a channel for receiving an edge of a pane of glass, at least the side portions being hollow and filled with a hard intumescent material, the intumescent material being of laminar form with the layers extending transversely
20 relative to the channel, each layer of intumescent material being formed so that on intumescence expansion occurs predominantly in a direction perpendicular to the plane of the layer, the terminal end portion of each side portion being formed so as to permit intumescent material
25 to exude from the interior of the side portion so that during intumescence the intumescent material expands to cover the surface of the pane of glass to define an insulative border of intumesced material.

3. A glazing strip according to Claim 2 wherein the
30 bottom portion of said casing is hollow and is filled with intumescent material.

4. A glazing strip according to Claim 2 or 3 wherein the casing is provided with an intermediate portion located between said side portions to define a pair of
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channels.

5. A glazing strip according to Claim 4 wherein said intermediate portion is hollow and filled with a hard or soft intumescent material.

5 6. A glazing strip according to any preceding claim wherein the hard intumescent material is hydrated sodium silicate based intumescent material.

7. A glazing strip according to Claim 6 wherein each layer of hard intumescent material is reinforced with
10 glass fibres arranged to cause said predominant direction of expansion during intumescence.

8. A glazing strip according to any preceding claim wherein the casing is an extrusion formed from a suitable plastics material such as polyvinylchloride.

15 9. A glazing strip substantially as described with reference to and as illustrated in any of the accompanying drawings.

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